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NATA Guidelines in Elective Orthopedic Surgery (Our Experience)

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Abstract- Introduction: Previously undiagnosed anemia is common in elective orthopedic surgery and is associated with increased likelihood of blood transfusion, as well as increased perioperative morbidity and mortality. A multidisciplinary panel of physicians was convened by the Network for Advancement of Transfusion Alternatives (NATA) with the aim of developing practice guidelines for the detection, evaluation and management of preoperative anemia in elective orthopedic surgery.

Methods and results: The following recommendations were made for the patients scheduled for the orthopedic surgery: 1. The hemoglobin level was estimated to be based on at least 28 days before the planned orthopedic surgery, 2. Preoperative hemoglobin level recommended for women $\geq 120\text{g/l}$ and for men $\geq 130\text{g/l}$, 3. In case of the existence of anemia, the immediate implementation of laboratory testing to determine the cause of anemia was recommended, 4. Any nutritional deficiency should be compensated 5.

Conclusion: Use of stimulators of erythropoiesis is recommended.

Keywords: *anemia, blood transfusion, preoperative assessment.*

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NATA Guidelines in Elective Orthopedic Surgery (Our Experience)

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Abstract- Introduction: Previously undiagnosed anemia is common in elective orthopedic surgery and is associated with increased likelihood of blood transfusion, as well as increased perioperative morbidity and mortality. A multidisciplinary panel of physicians was convened by the Network for Advancement of Transfusion Alternatives (NATA) with the aim of developing practice guidelines for the detection, evaluation and management of preoperative anemia in elective orthopedic surgery.

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I. INTRODUCTION

According to the WHO criteria (World Health Organization) satisfactory hemoglobin levels are $\leq 120\text{ g/l}$ for women and $\leq 130\text{ g/l}$ for men. Severe anemia is defined as hemoglobin $\leq 100\text{ g/l}$ (1). In the overall population, prevalence of anemia increases with age. People older than 65 years are more likely to be anemic (1, 2). In adult surgical patients, the incidence of preoperative anemia varies from 5 to 75%, depending on the age and gender of patients, type of surgery and the criteria for determining anemia. Numerous studies have shown that more than 20% of patients admitted for planned surgery are anemic (2). According to a large national study in the United States (U.S.), 35% of patients who were subjected to planned orthopedic surgery had preoperative hemoglobin less than 130 g/l . Most of the patients were women and one-third had iron deficiency (2, 3, 4).

During a large retrospective study investigated in 1958 for Jehovah's Witnesses (religious group that does not want to accept someone else's blood transfusion for the purposes of treatment) undergoing

non-cardiac surgery, it was noted that the value of preoperative hemoglobin $\leq 100\text{ g/l}$ is associated with a significant increase in perioperative mortality. More significantly, perioperative mortality is increased in cardiovascular patients because these patients are less able to tolerate anemia (5). In his research, Rashig has shown that the preoperative hemoglobin level $\geq 130\text{ g/l}$ and hematocrit $\geq 30\%$ reduce the use of perioperative transfusion of allogeneic blood for more than 90% (6). Similar results were obtained by Lawrence. In his studies he showed that high preoperative hemoglobin levels significantly improve the postoperative recovery of patients (7). After surgery and trauma inflammatory cytokines that reduce iron release from the gastrointestinal tract are secreted, reducing sequestration of iron in macrophages, decreasing production of erythropoietin in the kidney and giving rise to anemia.

Network for Advancement of Transfusion Alternatives (NATA) provides recommendations for detection, evaluation and treatment of preoperative anemia. These recommendations were developed by experts from several fields who deal with blood transfusion for planned surgical procedures in orthopedic surgery, expected blood loss, and the need for allogeneic blood transfusion (11). Application of substances that stimulate hematopoiesis in patients undergoing major surgical procedures, patients with chronic renal failure, patients with anemia due to malignancy, and patients undergoing chemotherapy is fully justified. In clinical practice, recombinant human erythropoietin rHuEPOs being used more often (16, 17). Use of erythropoietin and compensation of iron deficiency substantially correct preoperative anemia, reduce allogeneic blood transfusion and, indirectly, reduce perioperative morbidity and mortality, and therefore the total cost of treatment of patients (17).

Today, allogeneic blood transfusion is a significantly safer method, but its implementation is still associated with the emergence of numerous complications such as significant increase in perioperative morbidity and mortality, number of days spent in the hospital and the total cost of treating patients. To avoid these complications, in recent decades, need for timely and appropriate diagnosis, evaluation and treatment of preoperative anemia is crucial.

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